Nabin K. Malakar, PhD

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Education

- **PhD**, Physics — December 2011
  University at Albany, State University of New York (SUNY), Albany, NY
- **MS**, Physics — May 2008
  University at Albany, SUNY, Albany, NY

Appointments

- **Postdoctoral Research Scientist** — Aug 2014- Present
  NASA JPL, Caltech, Pasadena, CA
- **Postdoctoral Researcher** — 2013- 2014
  NOAA-CREST, City College of New York, CUNY.
- **Part-time Lecturer, Physics** — Fall 2012
  University of Texas at Dallas
- **Research Associate** — 2011 –2013
  University of Texas at Dallas
- **Graduate Research/Teaching Assistant** — 2006 - 2010
  Department of Physics, University at Albany, SUNY

Teaching Experience

- Mentored Graduate, Undergraduate and high-school students for capstone projects.
- **Teaching Assistant**, 2006-2010, Department of Physics, University at Albany, SUNY.
- **Physics Tutor**, Fall 2010, (CARSS), NSF-Funded Tutoring program
- **Guest Lecturer**, Department of Physics, University at Albany, SUNY
  Taught various graduate and undergraduate classes.
- **Full-Time Faculty,** Undergraduate level physics, June 2005-July 2006, Himalayan White House International College, Kathmandu, Nepal.

Funding

Research

- Travel Grant, CUNY Postdoctoral Travel Award, 2014, — $1000.00
- Travel Grant, Graduate Student Organization, Summer 2010, — $375.00
- "*Designing Autonomous Intelligent Robots*", N.K. Malakar, PI. — $440.00
  Benevolent Association Research Grant, University at Albany, SUNY, Spring 2009.

Organizational

- **Recognized Graduate Student Organization (RGSO) Grant,** — $225.00
  N.K. Malakar, Secretary, Nepali Student-RGSO: Academic Year 2009/2010.
- **Recognized Graduate Student Organization (RGSO) Grant,** — $750.00
  N.K. Malakar, President, Physics-RGSO: Academic Year 2007/2008,
  Also the winner of the "Most educationally enriching RGSO" award.

Awards and Recognition

- Recognition by JPL Community Service and Volunteerism Recognition Event.

- CUNY Postdoctoral Travel Award, The City College of New York. (2014)
- Benevolent Research Grant, SUNY at Albany, USA (2009)
- Summer Research Assistant with Prof. Kevin H. Knuth; SUNY at Albany, USA (summer 2007-2009)
- Outstanding Performance in Comprehensive Exam, SUNY at Albany, USA (2007)
- Selected by IAF as the "representative student" of Tribhuvan University to participate in the International Astronautical Congress, Bremen, Germany (2003)

Community Service

Scientific Service

- Guest Editor, Special Issue of Journal *Sustainability*, 2016.
- International Conference Mountains in the Changing World, Scientific Committee, 2016
- JPL Openhouse Volunteer, 2014.
- Organizer/Chair, First International Electronic Conference on Entropy and Its Applications, 3-21 November 2014.
- Outreach committee, IEEE Dallas GOLD, 2012.
- IEEE GOLD Sci-Tech Volunteer, 2012, Dallas, TX
- Telescope Operator at UAlbany for public stargazing events, Fall 2009, Spring 2010, University at Albany, SUNY.
- Robotics Demonstrations, UAlbany Community Day, 2009, University at Albany, SUNY.
- Robotics Demonstrations, Take Our Daughters and Sons to Work Day: 2009, University at Albany, SUNY.
- Robotics Demonstrations, Junior first LEGO League, Fall 2008, University at Albany, SUNY.

Other Services

- Volunteer tutor for STARS program for Lake Avenue Community Foundation, Pasadena, CA
- Fight Cancer Event, SUNY Albany, Fund raising, 2009.
- Flag Bearer, UAlbany Graduation, Spring 2008, and Winter 2011, University at Albany, SUNY, Albany, NY, USA.
- Judicial Board, Graduate Student Organization, University at Albany, SUNY, Albany, NY, USA.
- Komen Race for the Cure, 2007, Albany, NY, USA.
- Founder moderator for Google Group of Nepal Physical Society (227 members): Since Dec 2006.

Service to the Department

- Graduate admission Committee, 2009-2010
  Department of Physics, University at Albany, SUNY.

Publications

1. *N. Malakar* and G. C. Hulley, (2016), "A Water Vapor Scaling Model for Improved Land Surface Temperature and Emissivity Separation of MODIS Thermal Infrared Data", Remote Sensing of Environment, 2016, DOI: 10.1016/j.rse.2016.04.023
2. T. Islam, G. C. Hulley, *N. Malakar*, R. Radocinski, S. Hook (2016), "A physics-based algorithm for the simultaneous retrieval of land surface temperature and emissivity from VIIRS thermal infrared data", IEEE TGARS, in review
3. G. C. Hulley, *et al*. "High spatial resolution imaging of methane and other trace gases with the airborne Hyperspectral Thermal Emission Spectrometer (HyTES)", Atmos. Meas. Tech., doi:10.5194/amt-2016-8, 2016.
4. G. C. Hulley, S. J. Hook, E. Abbott, *N. Malakar,* T. Islam, M. Abrams, "The ASTER Global Emissivity Dataset (ASTER GED): Mapping Earth's emissivity at 100 meter spatial scale", Geophysical Research Letters, 2015.
5. *N. Malakar*, N. Chowdhury, B. Gross, F. Moshary, "Impacts of surface albedo models on high-resolution AOD retrieval", SPIE Remote Sensing, 2015.

6. K. H. Knuth, M. Habeck, *N. Malakar*, A.M. Mubeen, B. Placek, "Bayesian Evidence and Model Selection", Digital signal Processing, (2015).
7. D. J. Lary, F. S. Faruque, *N. Malakar*, A. Moore, B. Roscoe, Z. Adams, Y. Eggelston, "Estimating the global abundance of ground level presence of particulate matter (PM2. 5)", Geospatial health 8 (3), 611-630, 2014.
8. L. Cordero, *N. Malakar*, Y. Wu, B. Gross, and F. Moshary, "Assessing PM2.5 Estimates using Data Fusion of Active and Passive Remote Sensing Methods", Special Issue of British Journal of Environment and Climate Change, 3 (4), 2013.
9. *N. Malakar*, D. Gladkov, and K. H. Knuth, "Modeling a Sensor to Improve Its Efficacy,"Journal of Sensors, vol. 2013. doi:10.1155/2013/481054.
10. D. Gencaga, *N. Malakar*, and D. J. Lary, "Survey on the estimation of mutual information methods as a measure of dependency versus correlation analysis" AIP Conf. Proc. 1636, 80 (2014)
11. *N. Malakar*, D. Gencaga, and D. J. Lary, "Towards identification of relevant variables in the observed Aerosol Optical Depth bias between MODIS and AERONET observations", AIP Conf. Proc. 1553, 69 (2013)
12. R. Stoneback, *N. Malakar*, D. Lary, R. Heelis, "Specifying the Equatorial Ionosphere using CINDI on C/NOFS, COSMIC, and DINEOFs", Journal of Geophysical Research, 2013.
13. *N. Malakar*, D. J. Lary, A. Moore, D. Gencaga, B. Roscoe, A. Albayrak and J. Wei, "Estimation and Bias Correction of Aerosol Abundance using Data-driven Machine Learning and Remote Sensing", *Intelligent Data Understanding (CIDU), 2012 Conference on*, Oct. 2012. doi: 10.1109/CIDU.2012.6382197.
14. *N. Malakar*, K. H. Knuth and D. J. Lary, "Maximum Joint Entropy and Information-Based Collaboration of Automated Learning Machines", The 31st International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering. AIP Conference Proceedings, 1443, pp. 230-237 (2012).
15. *N. Malakar*, K. H. Knuth, "Entropy-based search algorithm for experimental design", The 30th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering. AIP Conference Proceedings, 1305, pp. 157-164 (2010).
16. *N. Malakar*, A. J. Mesiti and K. H. Knuth, "The Spatial Sensitivity Function of a Light Sensor" The 29th International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering. AIP Conference Proceedings, 1193, pp. 352-359 (2009).
17. *N. Malakar* and U. Khanal, "A Study of Centrifugal Force in Kerr de Sitter Geometry ($0 < a < 0.6$)", J. of Nepal Phys. Soc., 23, 1, 2007.
18. *N. Malakar* and U. Khanal, "A Study of Centrifugal Force in Kerr de Sitter Geometry" Scientific World, Annual Journal of Ministry of Environment, Science and Technology, 4, 4, (2006).
19. *N. Malakar* and U. Khanal, "The Null Geodesics in Kerr de Sitter space time" Scientific World, Annual Journal of Ministry of Environment, Science and Technology, 3, 3, (2005).

Science Product Documents

1. *G. C.* Hulley, S. Hook, W. Johnson, P. Guillevic, *N. Malakar*, (2016), Hyperspectral Thermal Emission Spectrometer (HyTES) Level-2 Land Surface Temperature and Emissivity Algorithm Theoretical Basis Document, JPL Publication XX, Jet Propulsion Laboratory, California Institute of Technology, May 2016.
2. *G. C.* Hulley, *N. Malakar*, S. J. Hook, and T. Hughes (2012), MODIS MOD21 Land Surface Temperature and Emissivity Algorithm Theoretical Basis Document, JPL Publication 12-17, Jet Propulsion Laboratory, California Institute of Technology, Aug 2012.
3. *G. C.* Hulley, R. Freepartner, *N. Malakar*, S. Sarkar, (2016), MODIS MOD21 Land Surface Temperature and Emissivity Users Guide Collection 6, Jet Propulsion Laboratory, California Institute of Technology, May 2016.
4. *G. C.* Hulley, T. Islam, *N. Malakar*, (2016), VIIRS Land Surface Temperature and Emissivity Algorithm Theoretical Basis Document, Jet Propulsion Laboratory, California Institute of Technology, Feb 2016.

Selected Presentations

1. *N. Malakar*, Hulley, G C. (2015), "Validation and Assessment of Heritage and New MODIS Land Surface Temperature and Emissivity Products for the Creation of Unified Earth System Data Records", American Geophysical Union (AGU) 2015
2. *N. Malakar*, G Hulley, S Hook, N Vance (2015), "Simulated ECOSTRESS L2 Products from the HyspIRI Airborne Campaign", 2015 HyspIRI Science and Applications Workshop
3. *G. C.* Hulley, T. Islam, *N. Malakar*, (2015), "MODIS and VIIRS Land Surface Temperature and Emissivity: A Consistent and High Quality Continuity Data Record", American Geophysical Union, San Francisco, CA, AGU 2015
4. *G. C.* Hulley, *N. Malakar*, T. Islam, S. Hook, P. Guillevic (2015), "Land Surface Temperature and Emissivity (LST&E) products for MODIS and VIIRS Continuity", MODIS/VIIRS Science Team meeting, Silver Spring, MD, 19-22 May, 2015
5. *N. Malakar*, B Gross, A Atia, F Moshary, SA Ahmed, MM Oo, "Bias Correction of MODIS AOD using DragonNET to obtain improved estimation of PM2.5", AGU 2013
6. *N. Malakar*, R. Lattoo, E. Ekwedike, B. Gross, J. Gonzalez, C. Vorosmarty, and G. Hulley, "Ingesting Land Surface Temperature differences to improve Downwelling Solar Radiation using Artificial Neural Network: A Case Study", AGU 2014.
7. D. Vidal, *N. Malakar*, B. Gross, L. Cordero, "Creating a Regional PM2.5 Map by fusing Satellite and Kriging Estimates", Society of Hispanic Professional Engineers (SHPE) conference in Detroit, Michigan, 2014, **1st Prize Winner (student)**.
8. *N. Malakar*, E. Ekwedike, B. Gross, J. Gonzalez, and C. Vorosmatry, "Creating High-Resolution Climate Meteorological Forecasts by Application of Machine Learning Techniques", 8th Annual Machine Learning Symposium 2014, NY, USA.
9. *N. Malakar*, A. Atia, B. Gross, F. Moshary, S. Ahmed, and D. Lary, "Regional estimates of ground level Aerosol using Satellite Remote Sensing and Machine-Learning", AMS 2014, Atlanta, GA, USA.
10. L. Cordero, *N. Malakar*, D. Vidal, R. Latto, B. Gross, F. Moshary, and S. Ahmed, "A Regional NN estimator of PM2.5 using satellite AOD and WRF meteorology measurements", AMS 2014, Atlanta, GA, USA.
11. *N. Malakar*, B. Gross, J. E. Gonzalez, P. Yang, and F. Moshary, "Use of NN based approaches to create high resolution climate meteorological forecasts", AMS 2014, Atlanta, GA, USA.
12. *N. Malakar*, M Oo, A Atia, B Gross, F Moshary, "Bias Correction of high resolution MODIS Aerosol Optical Depth in urban areas using the Dragon AERONET Network", AGU 2013 Oral Presentation in A31K (SWIRL_DA).
13. *N. Malakar*, L Cordero, Y Wu, B Gross, M Ku, "Injection Of Meteorological Factors Into Satellite Estimates Of Surface PM2.5", 2013 EMEP Conference (www.nyserda.ny.gov/emep-2013), Albany, NY.
14. L Cordero, *N. Malakar*, Y Wu, B Gross, F Moshary, M Ku, "Assessing satellite based PM2. 5 estimates against CMAQ model forecasts", SPIE Remote Sensing, Germany.
15. AA Atia, A Picon, *N. Malakar*, B Gross, F Moshary, "Ingesting MODIS land surface classification into AOD retrievals", SPIE Remote Sensing, Germany.
16. L Cordero, *N. Malakar*, Y Wu, B Gross, F Moshary, "Assessment of PM2. 5 Retrievals Using a Combination of Satellite AOD and WRF PBL heights in Comparison To WRF/CMAQ Bias Corrected Outputs", 2013 CMAS Conference, NC, USA.
17. R. Stoneback, *N. Malakar*, R. Heelis, D. Lary, "Specifying the Equatorial Ionosphere using DINEOFs", Sixth FORMOSAT-3/COSMIC Data Users' Workshop, 30 October - 1 November 2012, Boulder, Colorado, USA.
18. R. Stoneback, *N. Malakar*, D. Lary, R. Heelis, "Inferring Vertical Ion Drifts from Incomplete Datasets", 13th International Symposium on Equatorial Aeronomy, March 2012, Paracas, Peru.
19. O. Aulov, M. Halem, *N. Malakar*, D. Lary, "Human Sensor Networks: Use of Social Media and Self Organizing Maps for Automated Detection of Oil Spill Plumes in Satellite Observations", The Federation of Earth Science Information Partners (ESIP) Winter meeting, January 4-6, 2012, Washington, DC.
20. *N. Malakar*, "Interpolation of CINDI Data using Empirical Orthogonal Function", William B. Hanson Center for Space Sciences, University of Texas at Dallas, October 2011(*Invited*).

21. *N. Malakar* and K. H. Knuth, “Autonomous Entropy-Based Data Collection”, 5th Annual Machine Learning Symposium, October 2010, New York City, USA.
22. *N. Malakar*, A. J. Mesiti and K. H. Knuth, “The Spatial Sensitivity Function of a Light Sensor”, MaxEnt2009, July 2009, Oxford, Mississippi, USA.
23. *N. Malakar* and K. H. Knuth, “The Field of A Permanent Magnet: A Challenge For Competing Models”, MaxEnt2008, July 2008, Sao-Paulo, Brazil.
24. *N. Malakar* and K. H. Knuth, “A Bayesian Approach to Source Separation”, Physics All Students Conference at Albany, April 2008, University at Albany, SUNY, Albany, NY, USA.
25. *N. Malakar*, "Experimental Data Analysis: A Bayesian Approach", January 2008, Hetauda School of Management and Social Sciences, Nepal (*Invited*).

Professional Societies

- American Geophysical Union (AGU): Since 2011.
- American Meteorological Society (AMS): Since 2013
- Nepal Physical Society (Life Member).